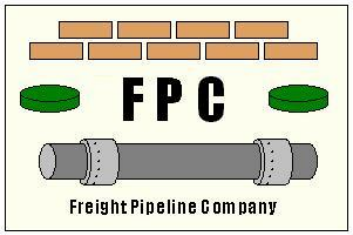
NSF-SBIR Phase II Project Workshop Presentation

Louisville, Kentucky, May 19, 2006



Freight Pipeline Company (FPC)

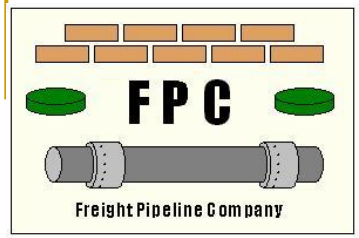
Project Title:

Compacting Fly Ash to Make Bricks

Presented by Dr. Henry Liu, President

Freight Pipeline Company

Columbia, MO 65201



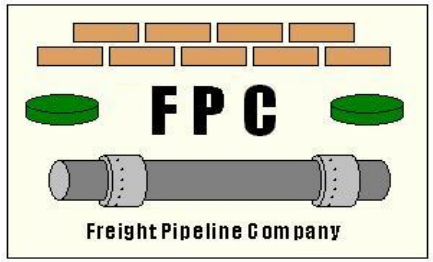
Freight Pipeline Company (FPC)

History: Company started by Dr. Henry Liu in 2001, upon his early retirement from University of Missouri (MU) College of Engineering.

Company Purpose: Develop and bring to commercial use certain new technologies invented by Dr. Liu that have strong commercial potential.

Strategy: Apply for government grants to develop new technologies and acquire patent rights. Then, either use Venture Capital or Angel Investor funds to bring new technology to commercial use, and/or license new technology for use by large existing companies.

Company Information:



Corporate Type: S-Corpation (registered in Missouri)

Ownership: Co-owned by Henry and Susie Liu

Corporate Structure/Management Team:

Board of Directors: Henry Liu, Susie Liu and Jason C. Liu

President: Henry Liu

Treasurer/Accountant/Business Manager: Susie Liu

Qualification of management team:

Henry Liu – Inventor, educator, researcher. Was founding director of Capsule Pipeline Research Center, an NSF sponsored State/Industry University Cooperative Research Center established at University of Missouri (1991-1999). Chaired Professor of Civil Engineering, University of Missouri-Columbia.

Susie Liu – M.S. degree in Accounting and CPA with over 20 years of business/accounting experience in government and private practice.

Jason C. Liu – MBA, Wharton Business School, University of Pennsylvania; CEO of Intrinsic Technologies, which is a high-tech firm in Lisle, IL (suburb of Chicago); extensive experience in managing high-tech firms, dealing with VC firms, and expanding company through IPO (Initial Public Offering).

Number of Employees: Full-time (3); part-time (5)

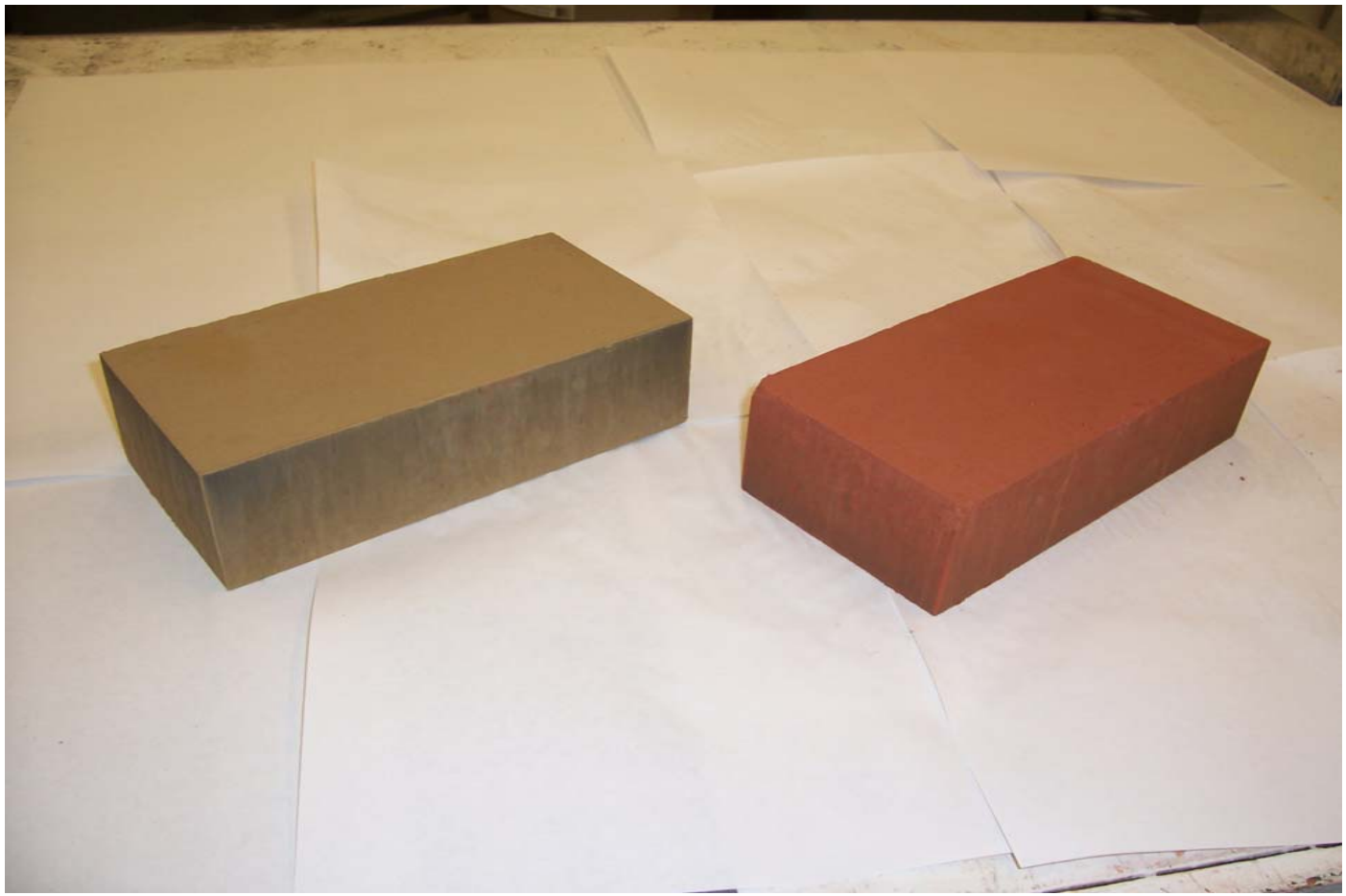
FPC Research Portfolio

Targeted Technologies:

1. **Fly Ash Brick**
2. **Biomass Logs/Tablets**
3. **Pneumatic Capsule Pipeline (Freight Pipeline)**

FPC Targeted Technology No.1:

Fly Ash Bricks

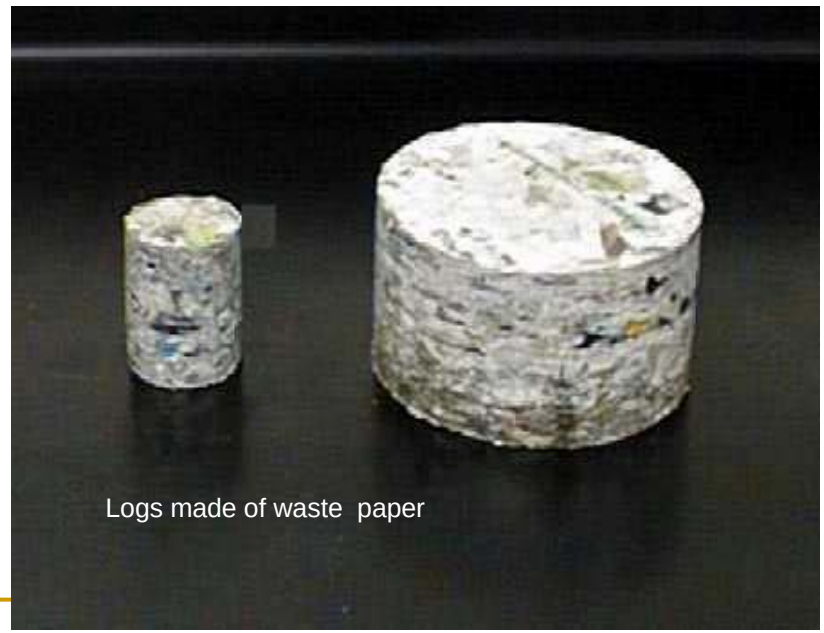


FPC Targeted Technology No. 2

Biomass Tablet Fuel (BTF)

Biomass tablet fuel is a densified biomass material of cylindrical shape, which can be used as a solid fuel for heating buildings, and liquefaction & gasification of biomass to produce liquid or gaseous fuels.

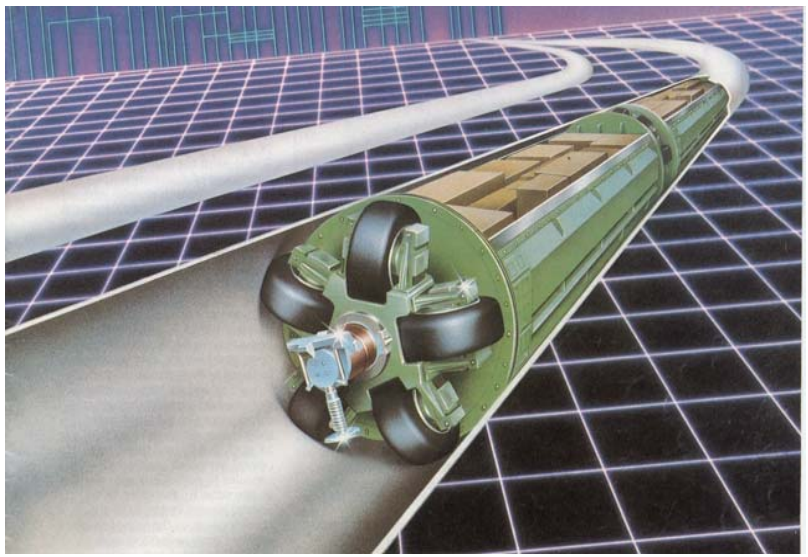
Log made of dry grass



Logs made of waste paper

FPC Targeted Technology No. 3: Pneumatic Capsule Pipeline (PCP)

(Note: Completed a feasibility study for using PCP to transport freight (various cargoes) underground in New York City. Also completed a project sponsored by DOE, to design a highly energy-efficient PCP system powered by Linear Induction Motor. Company work in this area is limited to feasibility study, planning, and R & D .)



Product/Technology/Competition

Fly Ash Brick

- The NSF-SBIR Phase II project is focused on completing the remaining R&D to bring the fly ash brick technology to commercial use in 2 years.
- The NSF project is designed to address the need of FPC research portfolio No.1 targeted technology – Fly Ash Brick.
- The fly ash brick technology is unique in the following regards:

1). It will solves an important solid waste disposal problem facing electric utilities.

2). Much less energy is used to produce the fly ash brick than producing fired clay bricks.

3). The cost of production of the fly ash brick is expected to be approximately 10% less than that of existing concrete bricks, and 20% less than that of fired-clay bricks.

4). The fly ash brick shape and size are extremely uniform, which enables saving of approximately 15% labor cost in laying bricks. (Most important value proposition).

Product/Technology/ Competition

Fly Ash Brick (continued)

- The technology is innovative, novel, and appreciated by both professionals and the public. It won two recent awards: the Thomas Barton Award of the World of Coal Ash Conference in 2005, and the Modern Marvel Invention Now Challenge in 2006. An Associated Press release on fly ash brick technology is pending at the time of mailing in this presentation to NSF.
- FPC has applied for both a U.S. and PCT patents (patents pending).
- Competition is with clay bricks and concrete bricks for the housing market.
- Customers are expected to be willing to pay the same price as for concrete bricks and fired clay bricks.

Market Opportunity

Fly Ash Brick

- **Business Model:** **FPC will not manufacture or sell the fly ash bricks. Rather, it will license the technology to large brick companies for use.**
- **Types of Services:** **FPC will provide technical services to licensees on a fee basis. Such services include planning new factories to manufacture fly ash bricks, testing the suitability of fly ashes from various power plants in making brick, testing samples of manufactured fly ash bricks to monitor quality, and troubleshooting.**
- **Income Sources:**

  (1) royalty (licensing fee),

  (2) technical services provided to support licensees.

  (3) R & D contracts from government sources.

Market Opportunity

Fly Ash Brick

- **Target Customers: FPC's target customers are our licensees – large brick companies that use the technology to manufacture and sell fly ash bricks.**
- **Brick's customers: The customer of the fly ash bricks are the same as that of ordinary clay bricks and concrete bricks. They include: brick and masonry-product distributors, building contractors, architects that select and specify bricks for projects, stores that sell bricks such as Home Depot or Lowes.**
- **Market Size:**
- **Broad Market– 9 billion bricks used annually in the U.S.**
- **Niche Market – Bricks for housing and landscape**
- **(estimated at 6 billion annually).**
- **Market Growth Strength: Increasing at 3% (same as for the housing industry market).**

Finance and Revenue Model

Fly Ash Brick

- **Funds needed by FPC beyond Phase II to bring technology to market**: **$2 million**.
- **How to use the funds ?** -- **Setting up a licensing team to license the technology at fast rate, and setting up a technical team to provide services to licensees.**
- **Where to get the $2 million from?** – **venture capital** or **angel investors**.

Revenue stream after Phase II

Fly Ash Brick

1. From **Royalty:** **2% of the income from brick sales (Assuming each thousand bricks are sold at $300, the income from royalty for a plant that produces 50 million bricks is $300,000 annually. The income will multiply with growing numbers of factories built.**

2. From **Service Fees:** **$2K for each million bricks produced. The income also multiplies with growing numbers of factories built -- $100,000 for the first plant that produces 50 million bricks, etc.**

FPC Revenue Stream from Licensing Fly Ash Brick and Related Business (Minimum Goal)

Revenue Item	Annual Revenue (Million Dollars)				
	Year 2008	Year 2009	Year 2010	Year 2011	Year 2012
Royalty	0.3	0.6	0.9	1.2	1.5
Technical Services	0.1	0.2	0.3	0.4	0.5
R & D	0.5	0.6	0.7	0.8	0.9
Total	0.9	1.4	1.9	2.4	2.9

Note: Revenues from royalty are the largest and most profitable

This is the last slide!

Thank You!